NOTES.

THE meeting of the International Geological Congress, which is to be held in Paris in 1900 (August 16 to 28), promises to be one of exceptional interest and success. It takes place at a time when a grand universal exhibition will attract many men of science from all countries. It represents a science of progressive character, which deals not only with the history of the earth and of the life which has existed, but furnishes the basis for geographical study, lends aid in art and manufactures, and is of essential importance in mining, agriculture, and hydrology. Subjects such as these draw men together irrespective of their nationality, and form bonds of union which political differences cannot rend asunder. The Committee of Organisation is constituted as follows: President, M. Albert Gaudry, Professor in the Museum of Natural History; Vice-Presidents, MM. Michel Lévy and Marcel Bertrand; General Secretary, M. Charles Barrois. The excursions which have been planned to follow the ordinary meeting number no less than nineteen, and they are so arranged that every important district in France and along its borders, and all formations of particular geological interest will be visited. Among the districts are the Paris Basin, the Boulonnais, Normandy, the Ardennes, Picardy, Brittany, Touraine, Dordogne, the Alps and Mount Blanc, Bordeaux, and the Pyrenees.

WE regret to see the announcement of the death of Prof. Gustav Wiedemann, professor of physics in the University of Vienna, at seventy-three years of age.

THE death is announced of M. Naudin, member of the section of botany of the Paris Academy of Sciences, at eighty-three years of age; and of Dr. Franz Ritter von Hauer, the distinguished geologist, at Vienna, at seventy-seven years of age.

AT a meeting on Monday of the Royal College of Physicians of London, Dr. William Selby Church, senior physician to St. Bartholomew's Hospital, was elected the president of the college.

SCIENTIFIC visitors to Paris at Easter will be interested to know that the Société Français de Physique will hold its annual exhibition of new apparatus and experiments on Friday and Saturday, April 7 and 8. The exhibition will be held in the rooms of the Society, 44 rue de Rennes.

THE French Minister of Public Instruction will preside at the closing meeting of the thirty-seventh Congrès de Sociétés savantes on April 8. The Congress opens at Toulouse, on April 4. The Toulouse Geographical Society has organised in connection with the Congress an exhibition of apparatus for the decimal measurement of time and angles.

A REPORT by Prof. T. E. Thorpe, F.R.S., Principal of the Government Laboratory, and Prof. Thomas Oliver, physician to the Royal Infirmary, Newcastle-upon-Tyne, concerning the employment of components of lead in the manufacture of pottery, and their influence upon the health of the workpeople engaged in that industry, has been issued as a Blue Book.

AT the last meeting of the Institution of Mechanical Engineers Mr. Arthur T. Walker, a member of the Council of the Iron and Steel Institute, was elected a vice-president in succession to the late Sir Douglas Galton.

THE *British Medical Journal* announces that Dr. T. Grigor Brodie, at present lecturer on physiology at St. Thomas's Hospital Medical School, has been nominated by the laboraratories committee of the Royal Colleges of Physicians and Surgeons to be director of the research laboratories on the Thames Embankment.

AT Monday's meeting of the Royal Geographical Society the President made the gratifying announcement that Mr. L. W. Longstaff, a Fellow of the Society, had subscribed the sum of 25,000*l.* to the fund for the scientific exploration of the Antarctic regions. A vote of thanks to Mr. Longstaff for his munificent gift, proposed by Sir Clements Markham, was seconded by Lord Lister, and enthusiastically carried. This generous donation brings the fund at the disposal of the Joint Antarctic Committee up to 40,000*l.*, which is sufficient to ensure our co-operation with Germany in 1900, but is not enough to enable the expedition to be carried out on a scale worthy of our country. It is to be hoped that the example set by Mr. Longstaff will be followed by others who think that England should take the first place in Antarctic exploration, and are in a position to enable her to do so.

IT is announced that the Russian expedition for taking meridian measurements in Spitsbergen will leave St. Petersburg on May 1. Two steamers have been placed at the disposal of the expedition by the Russian Ministries of Marine and Ways and Communications, and the Minister of Finance has granted 50,000 roubles for two years. M. Bjalinizki, the zoologist, and Dr. Bunge, the Polar explorer, will accompany the expedition, which will be under the leadership of Staff-Captain Sergievski.

THE fortieth meeting of the Institution of Naval Architects was held in London on Wednesday, Thursday and Friday of last week, the Earl of Hopetoun, president of the Institution, presiding. The annual report, read at Wednesday's meeting, states that the Council have had for some time under consideration the rules for the election of members and associates. Following the example of the Institution of Civil Engineers and of the Mechanical Engineers, they proposed that a new class should be introduced, to be called associate members, who would consist mainly of young men fully trained, but not yet holding positions of importance. The candidates must have served a four years' apprenticeship to a naval architect and shipbuilder, or must have had four years' training in a recognised naval college. This change in the rules was adopted by the meeting. The new rules will not come into force until Friday, March 24, 1900. A gold medal was presented to Prof. Captain Kriloff, for his papers on "The general theory of the oscillations of a ship on waves" and "On stresses experienced by a ship in a seaway"; and also one to Prof. Hele-Shaw, for his two papers describing his "Investigation of the nature of surface resistance of water and of stream-line motion under certain experimental conditions." The annual dinner of the Institution was held at the Hotel Cecil on Wednesday evening, March 22.

REFERENCE has already been made to the new scheme for the Physic Garden at Chelsea. It is now definitely announced that the garden has been handed over to the Trustees of the London Parochial Charities, who have agreed to dedicate a sum of 800*l.* yearly to its maintenance. Under the new scheme the garden is to be administered exclusively for the promotion of the study of botany with especial reference to the requirements of general education, scientific instruction, and research in botany, including vegetable physiology, and instruction in technical pharmacology as far as the culture of medical plants is concerned. The practical management of the garden will be vested in a committee formed of representatives nominated by the Trustees of the London Parochial Charities, the Treasury, the Lord President of the Council, the Technical Education Board, the Royal Society, the Royal College of Physicians, the Society of Apothecaries, the Pharmaceutical Society, the London County Council, and the Senate of the University of London. Earl Cadogan and his successors, as representing Sir Hans Sloane, who conveyed the garden in 1722 to the Apothecaries'

Company in trust for the encouragement of botany, is also a member of the committee.

THE following are the lecture arrangements after Easter at the Royal Institution :—Prof. J. Cossar Ewart, three lectures on zebras and zebra hybrids; Prof. Silvanus P. Thompson, two lectures on electric eddy-currents (the Tyndall Lectures); Prof. W. J. Sollas, three lectures on geology; Prof. Dewar, three lectures on the atmosphere; Mr. Lewis F. Day, three lectures on embroidery; Prof. L. C. Miall, two lectures on water weeds; Mr. Louis Dyer, three lectures on Machiavelli; Mr. W. L. Brown, two lectures on to Iceland in search of health; Mr. Edgar F. Jacques, three lectures on the music of India and the East, and its influence on the music of Europe (with musical illustrations). The Friday evening meetings will be resumed on April 14, when a discourse will be delivered by Prof. A. W. Rücker on earth currents and electric traction. Succeeding discourses will probably be given by Dr. F. W. Mott, Prof. C. A. Carus Wilson, Dr. W. J. Russell, Prof. T. Preston, the Right Rev. the Lord Bishop of Bristol, Sir William Martin Conway, Mr. H. G. Wells, and others.

WE are glad to be able to announce that with March 1 the Administration of Telegraphs of Mexico have commenced the publication of daily weather charts, showing for 8h. a.m., Washington time, the state of the barometer, thermometer, and weather over that extensive country. Stations have been established in thirty-five localities, and these are augmented by a few voluntary observers. The service is organised on the principle of that of the Weather Bureau of Washington, and the system has been established primarily to meet the requirements of the Telegraph Administration, and, in the second place, to supply the Mexican Meteorological Observatory with trustworthy information. Weather forecasts are not yet issued, but no doubt the meteorological authorities will be glad to make good use of the opportunities offered. The charts are published in a new paper entitled *Boletin Telegráfico.*

IN the current number of the *Revue Générale des Sciences*, there is an interesting note on ceramic novelties, recording results of experiments promoted by the Society for the Encouragement of National Industry towards the solution of certain problems of pressing importance in the pottery industry. Under the title of "Atelier de Glatigny, Études et Notes No 1, Imprimeries Cerf à Versailles," M. Glatigny, a practical potter of repute, sets forth the lines of scientific and artistic thought that have found expression in his work. There is no attempt made to deduce general rules applicable to every branch of the trade, but a faithful record of actual experiments definitely and rigorously carried out. In a word, it is the record of an attempt to replace empiricism by careful scientific work, and as such it ought to be of especial service in this country, where rule-of-thumb still holds absolute sway. The chief points treated are: the influence of the atmosphere of the kiln on the colours produced by well-known colouring oxides; the influence of different ingredients on the dilatibility of body and glaze—a matter of the utmost importance to English potters, as one of the chief faults of their wares, the crazing of the glaze, is profoundly influenced by these factors; and, finally, the production of certain new pastes of the porcelain and stoneware type by the addition of substances such as powdered glass, oxide of zinc, magnesia, &c., to the substances commonly used for pottery pastes. One longs for the time when English potters shall publish the results of their labours in this way.

A DEPUTATION of representatives from the Decimal Association, chambers of commerce, educational institutions, and trade unions, waited upon Mr. Ritchie on Wednesday, March 22, at the House of Commons to urge upon the Government the compulsory adoption of the metric system of weights and measures on January 1, 1901. Several of the delegates described the advantages which metric system possesses, reference being made to the great waste of time involved in teaching our complicated system of arithmetic, and the loss of trade resulting from the use of a system not understood by other nations. In reply, Mr. Ritchie expressed himself in agreement with the arguments in favour of the metric system, but stated that his own view, and that of his colleagues, was that chaos and confusion would be created by the compulsory adoption of the metric system in this country, and it would be practically impossible to carry out a compulsory law on the subject. They had not only passed a law two years ago to make the metric system legal, but they had also added to their Board of Trade standards the standards for the metric system, and only seventeen of the whole of the local authorities in the country had come to verify their standards. It would be much better, if the chambers of commerce desired this system to be compulsory, that they should endeavour to popularise the system by putting it in practice. Certainly it would be an immense advantage to our export trade, and now that our merchants and manufacturers were alive to the disadvantages of the non-adoption of the new system they should do something in the way of adopting it. He had been in communication with other Government departments with the view of having it adopted compulsorily, and it was now under consideration.

DR. MARTIN FICKER, in a paper communicated to the *Zeitschrift für Hygiene*, describes an elaborate series of investigations he has made on some of the conditions affecting the vitality of certain pathogenic bacteria, especially those of cholera in artificial surroundings. To the student this paper is of importance, inasmuch as it at once indicates the spirit in which bacteriological research should be approached, and the pitfalls which beset the path of the unwary at every turn. The sense of dissatisfaction which surrounds a good deal of the work done with bacteria is due to the discrepancy which occurs in the results chronicled by different authors, and sometimes by one and the same author in the same subject. These discrepancies Dr. Ficker has sought to diminish in the future by pointing out some at least of the sources of error in such work, by calling attention to the importance of factors which are only too frequently overlooked. The memoir covers over seventy pages, and it is impossible to deal here with the numerous minute details which have been investigated by the author. Perhaps the most novel and interesting of the questions discussed is the influence exercised on bacteria by glass of different kinds in the vessels employed for their observation, a subject already dealt with in other connections by various investigators. As regards the degree of alkalinity imparted to water by glass of different origin, very wide divergence has been observed; and inasmuch as some bacteria, and notably those of cholera, are favourably affected by the alkalinity of their surroundings, this factor would certainly appear to be of importance. Various samples of glass were investigated in this connection, and marked differences were noted in the behaviour of cholera germs suspended in water in vessels of so-called Jena and other glass. Dr. Ficker's paper serves to emphasise once more how what superficially may appear to be inconsiderable trifles in detail, may be of supreme importance in determining the successful or otherwise management of bacteria.

THE stability of motion of a bicycle is a problem of the greatest interest, both practical and mathematical, which has too long remained unattacked. We are glad to see that Mr. F. J. W. Whipple, of Trinity College, Cambridge, has at last investigated this problem, and has been successful in obtaining conclusions of a practical kind. One of the most interesting points which had to be worked out was the condition that a machine could be ridden without holding the handles. Mr. Whipple finds that there are four critical velocities connected with the stability of the motion, which he calls V_1, V_2, V_3, and V_4. For velocities greater than V_1 the motion is unstable, but may be rendered stable by a rider who turns the first wheel towards the side on which he is falling, or moves his body away from that side. The force he has to exert in the former operation is comparatively great, whereas the distance he has to move his body in the latter case is small. For velocities between V_1 and V_2 the motion is stable, even when the rider does not move his body and makes no use of the handles. For velocities less than V_2 the motion without hands is unstable, but between V_2 and V_3 it is stable for a rider who moves his body through a very small distance in the same direction as the fall is carrying him. This distance is about 1/20 of the distance he is moved by the swaying of the machine. For velocities between V_2 and V_4 the motion is stable for a rider who keeps the motion of the handles as small as possible. For velocities below V_4 a rider who combines the two methods, using both his weight and his hands, may be successful. The balance for such low velocities is not automatic, but is a feat which requires conscious attention. Mr. Whipple, considering a typical machine, obtains the following values in miles per hour: $V_1 = 12{\cdot}2$, $V_2 = 10{\cdot}4$, $V_3 = 8{\cdot}5$, $V_4 = 7{\cdot}4$. He considers that practically V_2 is the most important factor in determining the ease of riding, but unfortunately its calculation for any given machine is not easy. In connection with the effects of spinning friction, it is pointed out that a well-inflated tyre is conducive to stability. Mr. Whipple's paper appears in the *Quarterly Journal* of Pure and Applied Mathematics for March.

A NEW method of photographing in natural colours is reported by *Science* to have been discovered by Prof. R. W. Wood, of the University of Wisconsin. The colours are said to be obtained by diffraction; and, though at present the production of the first finished picture is somewhat tedious, duplicates can be printed as easily as ordinary photographs are made. The pictures are on glass, and are not only colourless, but almost invisible when viewed in ordinary lights; but when placed in a viewing apparatus, consisting of a convex lens on a light frame, show the colours of nature with great brilliancy. The principle is that the picture and the lens form spectra which overlap, and the eye placed in the overlapping portion sees the different portions of the picture in colour depending on the distance between the grating lines at that place. Prof. Wood says the finished picture is a transparent film of gelatine with very fine lines on it, about 2000 to the inch on the average. The colours depend solely on the spacing between the lines, and are pure spectrum colours, or mixtures of such, the necessity of coloured screens or pigments, used in all other processes except that of Lippmann, having been overcome. The pictures can be projected on a screen by employing a suitable lantern, or can be viewed individually with a very simple piece of apparatus consisting of a lens and perforated screen mounted on a frame. It is difficult to form an opinion upon the method or results from the information so far available, and we hope that further details will soon be published.

IT is well known that aneroids are not to be depended upon for the determination of altitudes. When an aneroid and a mercurial barometer are subjected to a diminishing pressure, brought about either by increase of altitude or experimentally by means of an air-pump, it is found to indicate a lower reading than that shown by the mercurial barometer. The lower the pressure, and the greater the length of time the diminution of pressure is experienced, the greater is the loss in any individual aneroid. As the extent of the loss of an aneroid subjected to diminished pressure depends upon the length of time during which the instrument is exposed to this pressure, evidently a way to remedy the defect is to obtain an instrument which can be put in action when required to make a determination of pressure, and put out of gear or thrown out of action when not wanted for use. An aneroid which fulfils these conditions has been invented by Colonel H. Watkin, C.B., and is manufactured by Mr. James J. Hicks. The instrument has precisely the same appearance as an ordinary aneroid, and the only addition is a fly-nut at the back, by means of which the vacuum-box can be put in action when a reading is required. This aneroid has been reported upon favourably by Mr. Whymper and other travellers, and it is certainly an advance upon the ordinary instrument. When the instrument is in action a line on the ring, to which the fly-nut is fastened, coincides with an arrow upon the case. This, we think, admits of improvement, for the coincidence cannot be very accurately determined. In taking readings before and after putting the instrument out of action, we found a slight difference on each occasion, which may perhaps be due to the difficulty in bringing the ring back to the same point.

FROM the *Journal* of the Franklin Institute we learn that the Elliott Cresson gold medal has been awarded to Mr. Clemens Herschel, and John Scott legacy premiums and medals to Messrs. Frederick N. Connet and Walter W. Jackson for their joint invention of the Venturi meter, an apparatus designed for measuring the flow of liquids in pipes of any desired dimensions up to 60 inches or more in diameter. The Venturi proper, invented by Mr. Herschel, consists essentially of a tube containing a constriction through which the water has to flow, and by measuring the difference of pressure between the wider and narrower parts, the rate of flow of the liquid can be calculated by well-known formulæ. The two last-named inventors have devised the elaborate registering apparatus driven by clockwork, whereby the indications of the piezometer are made to give a record of the total quantity of water flowing through the pipe by a species of mechanical integration or "quadrature."

THE fifth edition of the *Naturalist's Directory* for 1899, published by Mr. L. Upcott Gill, is to hand. It contains the names, addresses, and specialities of several thousand field naturalists, as well as curators of museums and professors and lecturers on natural science. The zoologists alone occupy seventy-two pages, and a rough statistical tabulation of a few pages, selected at random, shows that ornithology and lepidoptera head the list, the numbers of specialists in each of these being more than double of that in any other department; ornithology and oology when added together have the majority. Mollusca, malacology and conchology, when combined, come next in point of numbers, entomology (in general) next, and coleoptera next again. Although the other orders of insects and the other branches of zoology are mostly represented, their devotees fall greatly behind those of the afore-mentioned subjects. Microscopy occupies twelve pages, and shows a large preponderance of specialists in pond life and vegetable physiology. Diatoms and foraminifera come next, but a long way behind, in popularity; and after these, bacteria, marine zoology, biology, photo-micrography, and micro-entomology divide the favours about equally. In botany, which occupies fifteen pages, phanerogams, as might be expected, have an overwhelming majority; while among cryptogams, mosses and hepaticæ appear to be most popular. Geology and palæontology extend over thirteen pages. In addition the volume contains a trade directory, a list of societies, field clubs and museums, from the Royal Society and British Museum downwards, and a list of books of the year on natural science. The long list of names in the *Naturalist's Directory* reassures us that field natural history of the good old sort still holds its own in the matter of popularity, despite the conflicting claims of laboratory science on the one hand, and photography and bicycling on the other.

Cosmos for February 25 contains an illustrated article on Volta's discovery of the cell which bears his name, and on the exhibition to be held at Como in commemoration of the centenary of the discovery.

The *Revue scientifique* for February 25 contains an account of a paper read before the French Association for the Advancement of Science by M. Armand Viré, on the peculiar cœcal fauna of the caves of the Jura and the Pyrenees. From it we learn that a subterranean laboratory for studying the modifications in the tactile and other organs of animals produced by darkness has been opened in the catacombs of the Jardin des Plantes at Paris, under the direction of Prof. Alphonse Milne-Edwards, and interesting results have already been obtained.

A new American botanical journal was started with the commencement of the current year, under the title of *Rhodora*. It is edited by Dr. B. L. Robinson, of the Gray Herbarium, Harvard University, and is brought out under the auspices of the New England Botanical Club.

Some attention has been recently directed to the qualities of rhea or ramie-fibre (*Boehmeria nivea*) as a material for textile fabrics. In the *Agricultural Gazette* of New South Wales for November 1898, Mr. H. N. Jackson advocates its growth for commercial purposes in that Colony.

We have received *Bulletins* Nos. 12–14 of the Geological and Geographical Commission of São Paulo, Brazil, entirely devoted to the botany of the district, and comprising monographs of the orders Compositæ, Solanaceæ, Scrophulariaceæ, Campanulaceæ, Cucurbitaceæ, Calyceraceæ, and Valerianaceæ. The diagnoses of the species, and even the characters in the claves to the genera, being entirely in Spanish, and not in Latin, renders it difficult to estimate the scientific value of the work, and at all events detracts from its usefulness.

A catalogue of valuable works on many branches of science, and including the *Transactions* of a number of learned societies, has been issued by Mr. B. Quaritch, who offers the works for sale.

Messrs. William Wesley and Son have issued a new number of their "Natural History and Scientific Book Circular," containing a classified catalogue of nearly two thousand books and pamphlets on geology, including works from the libraries of the late Mr. W. Topley and Mr. Richard Meade.

The *Transactions* of the Leicester Literary and Philosophical Society (vol. v. part iii., January 1899) contain a presidential address delivered by Mr. A. Colson on electricity and its uses, and papers on ovules, by the Rev. T. A. Preston, and on the structure and life-history of the cockroach, by Mr. W. J. Hall.

Among the lectures to be given during April at the Royal Victoria Hall, on Tuesday evenings at 8.30, are the following:—April 4 (Easter Tuesday): Mr. W. H. Shrubsole, on "Switzerland, past, present, and future." April 11: Mr. F. W. Rudler, on "The Geology of London." April 18: Prof. Lloyd Morgan, on "Instinct and Intelligence in Animals."

The fifth volume of the *Annales du Bureau des Longitudes* (Gauthier-Villars et Fils), which is dated 1897, but has only recently come to hand, contains several memoirs of interest. The first of these consists of a very complete account of the work done in determining the differences of longitude between San Fernando, Santa Cruz de Tenerife, Saint-Louis, and Dakar, besides a set of measures for determining the value of *g*, by Messrs. Bouquet de la Grye, Cecilio Pujazon, and Driencourt. This mission, it may be remembered, commenced its work in the year 1885, and was supplied with an excellent set of instruments. In the succeeding memoir, M. Bigourdan reports on the astronomical, physical and meteorological observations made at the camp at Joal (Senegal) during the total eclipse of the sun on April 18, 1893. The report contains a full account of the measurements for determining the position of the station, besides numerous tables and diagrams of the meteorological observations. From the astrophysical point of view the next report, by M. Deslandres, on his observations of the same eclipse is, perhaps, of more interest. M. Deslandres' equipment was chiefly spectroscopic, and he made great use of photography. In his report, he points out very clearly the necessity of such spectroscopic observations for settling and advancing certain questions relative to the solar atmosphere; and in Chapter iv. briefly summarises the history of hypotheses to explain the origin and different forms assumed by the corona. The memoir is accompanied by some fine heliogravures of the eclipse station and the corona. The last section of this volume is devoted to a report on the international conference on fundamental stars, which took place in 1896, including Dr. Gill's propositions for the values of astronomical constants.

In the year 1896, although many observing parties went to several places along the line of totality from which the total solar eclipse of August could be observed, it turned out that, owing to extremely bad weather conditions, only those who went to Novaya Zemlya were fortunate enough in obtaining observations. The late Sir George Baden-Powell, it will be remembered, took a small party of English observers in his yacht to that region, and it was there also that a party of Russian observers had taken up their station. A very detailed account of the work done by this latter expedition has just come to hand, and it will be found in vol. viii. (No. 1) of the *Memoirs of the St. Petersbourg Imperial Academy of Sciences* (Physical Mathematical Class). In addition to the astronomical observations referred to in this volume, there are given descriptions of the surveys and collections made by the expedition to their station. The volume contains numerous beautiful illustrations of the eclipse station, groups, rock-formations, glaciers, together with numerous large scale maps of the region traversed. Unfortunately, the whole memoir is published in the Russian language, so its utility will to a great extent be restricted.

The additions to the Zoological Society's Gardens during the past week include a Vervet Monkey (*Cercopithecus lalandii*), a Levaillant's Cynictis (*Cynictis penicillata*) from South Africa presented by Mr. J. E. Matcham; two Black-backed Jackals (*Canis mesomelas*) from South Africa, presented respectively by Mr. William Hare and the Trustees of the South African Museum; a Golden Agouti (*Dasyprocta aguti*) from South America, presented by Dr. G. L. Johnson; a Tawny Owl (*Syrnium aluco*), European, a Common Kestrel (*Tinnunculus alaudarius*), British, presented by Lady Evelyn Riddell; a White-tailed Eagle (*Haliaetus albicilla*) from Northern Asia, a Great Black-headed Gull (*Larus ichthyaëtus*) from Western Asia, presented by Dixon Bey; a Suricate (*Suricata tetradactyla*) from South Africa, deposited; two Coscoroba Swans (*Coscoroba candida*) from Antarctic America, a Long-tailed Duck (*Harelda glacialis*), North European, purchased; a Hybrid Macaque Monkey (between *Macacus cynomolgus*, ♂, and *Macacus rhesus*, ♀), a Crested Porcupine (*Hystrix cristata*), born in the Gardens.